

What Is Claimed Is:

1           1.     An improved method of oxidizing undesirable compounds residing within a liquid  
2 based gas processing system comprising:

3           (a)     heating a liquid absorbent containing undesirable compounds within a reboiler  
4 chamber to its boiling temperature, which is a temperature above the boiling point of water and  
5 below the temperature of degradation of said absorbent, to produce vaporized effluents;

6           (b)     condensing said effluents within a condenser;

7           (c)     transporting residual uncondensed effluents to and through a vaporizer wherein said  
8 effluents are first heated to re-vaporize any ambient condensed liquids;

9           (d)     transporting and introducing said re-vaporized effluents to a thermal oxidizer  
10 combustion chamber wherein (said effluents) are second heated to a temperature necessary to  
11 effectuate thermal destruction of undesirable compounds;

12           (e)     transporting and introducing said second heated effluents from said thermal oxidizer  
13 combustion chamber to and through the internal portions of a heat recovery tube bundle, said  
14 introduction and transport generating external tube surface temperatures sufficient to raise a liquid  
15 glycol based absorbent in contact therewith to its boiling temperature; and

16           (f)     transporting said second heated effluent from said tube bundle to and through a  
17 reboiler vent stack.

1           2.     The method as set forth in Claim 1 wherein said absorbent is diethylene glycol  
2 (DEG).

1           3.     The method as set forth in Claim 1 wherein said absorbent is triethylene glycol  
2     (TEG).

1           4.     The method as set forth in Claim 1 wherein said absorbent is one of a group of  
2     absorbents including ethylene glycol, tetraethylene glycol or glycerin.

1           5.     The method as set forth in Claim 1 wherein said undesirable compounds include  
2     benzene, toluene, ethylbenzene and xylene (BTEX).

1           6.     The method as set forth in Claim 1 further comprising the step of preheating said  
2     absorbent prior to its introduction into said reboiler.

1           7.     The method as set forth in Claim 6 wherein the step of preheating said absorbent  
2     prior to its introduction into said reboiler is accomplished by said absorbent's traversing of a heating  
3     means incorporated within a thermal oxidizer vent stack.

1           8.     The method as set forth in Claim 1 wherein said transporting and introducing said  
2     second heated effluents to and through the internal portions of a heat recovery tube bundle occurs  
3     at a controlled rate to regulate said external tube surface temperature.

1           9.     The method of Claim 1 further comprising the step of sparging said absorbent while  
2     said absorbent traverses the internal portion of a sparging or stripping pipe located within said  
3     reboiler.

1           10.    The method of Claim 1 wherein the transporting of said partially condensed effluents  
2     to and through a vaporizer means further comprises the step of collecting non-vaporized effluents  
3     in a reservoir.

1           11.    An improved apparatus wherein liquid absorbent is heated to its boiling temperature,  
2     which is a temperature above the boiling point of water and below the temperature of degradation  
3     of said desiccant to produce vaporized effluents thereof and wherein said vaporized effluents are  
4     condensed, comprising in combination:

- 5           (a)     a condenser;
- 6           (b)     a vaporizer within an oxidizer vent stack wherein said vaporized effluents are first  
7     heated to re-vaporize ambient condensed liquids;
- 8           (c)     a thermal oxidizer combustion chamber wherein said effluents are second heated to  
9     a temperature necessary to effectuate destruction of undesirable compounds;
- 10          (d)     a heat recovery tube bundle wherein the external surface temperature of said heat tube  
11     bundle is sufficient to raise a glycol based absorbent in contact therewith to said absorbent's boiling  
12     temperature;
- 13          (e)     a thermal oxidizer vent stack from within which said second heated effluent may be  
14     vented into the atmosphere; and

15 (f) a burner with temperature control means to maintain said effluents introduced to said  
16 thermal oxidizer at a temperature of not less than 1500°F at atmospheric temperature.

1 12. The apparatus of Claim 11 wherein said vaporizer further comprises a reservoir to  
2 contain liquid.

1 13. The apparatus of Claim 11 further comprising a skid support structure.

1 14. The apparatus of Claim 11 wherein said absorbent is glycol.

15. The apparatus of Claim 11 wherein said absorbent is diethylene glycol (DEG).

16. The apparatus of Claim 11 wherein said absorbent is triethylene glycol (TEG).

17. The apparatus of Claim 12 wherein said absorbent is one of a group of absorbents  
including ethylene glycol, tetraethylene glycol or glycerin.

1 18. The apparatus of Claim 11 further comprising a pre-heater means wherein said  
2 absorbent is preheated prior to its introduction to said reboiler.

1 19. The apparatus of Claim 11 further comprising at least one sparge pipe in contact with  
2 said absorbent within said reboiler.

1           20.    The apparatus of Claim 11 wherein said preheating means is a heat exchanger heated  
2 by said second heated effluents attempting to exit said thermal oxidizer vent stack.

1           21.    The apparatus of Claim 11 including a surge storage tank for deposit of liquid  
2 absorbent positioned independent of said thermal oxidizer and said reboiler.

1           22.    The apparatus of Claim 11 wherein said oxidizer vent stack and said vaporizer vent  
2 stack further each comprise a venting means to assist in the increasing or decreasing of temperature  
within said reboiler.

1           23.    The apparatus of Claim 11 further comprising heat insulation material generally  
2 attached to and throughout the heated internal portions of said apparatus.

1           24.    The apparatus of Claim 11 further comprising a spark arresting means attached to said  
2 thermal oxidizer chamber to extinguish sparks attempting to escape therefrom.